UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,993	03/30/2004	Tae-Sun Kim	2557-000196/US	2678

30593 7590 12/12/2007

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 8910
RESTON, VA 20195

EXAMINER	
TRAN, TRANG U	

ART UNIT	PAPER NUMBER
2622	

MAIL DATE	DELIVERY MODE
12/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/811,993	KIM ET AL.	
	Examiner	Art Unit	
	Trang U. Tran	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) *24-31* is/are withdrawn from consideration.

5)☒ Claim(s) *32-34* is/are allowed.

6)☒ Claim(s) *1-4,6,8-21 and 23* is/are rejected.

7)☒ Claim(s) *5,7 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 8 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Itani (US 2007/0229917 A1).

In considering claim 1, Itani discloses an interlaced-to-progressive conversion method (Fig. 1) comprising 1) receiving a control command to performed one of at least two interlaced-to-progressive conversion (IPC) techniques on input interlaced scan data, the control command being generated based on video information associated with the input interlaced scan data, the video information indicating at least whether the interlaced scan data is frame based or field based interlaced scan data (Fig. 1, elements 8-9 and 14-16, page 11, paragraph #0138); and 2) performing the IPC technique instructed by the received control command on the input interlaced scan data (Fig. 1, element 17, page 11, paragraph #0138).

The apparatus claim 8 is rejected for the same reasons as discussed in the corresponding method claim 1.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4, 6, 8-21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (US Patent No. 5,943,099) in view of Itani (US 2007/0229917 A1).

In considering claim 1, as discussed in the last Office action, Kim discloses all the claimed subject matter, note 1) the claimed receiving a control command to perform one of at least two interlaced-to-progressive conversion (IPC) techniques on input interlaced scan data is met by the spatial interpolator 110 and the temporal interpolator

120 (Fig. 1, col. 3, line 48 to col. 4, line 21), and 2) the claimed performing the IPC technique instructed by the received control command on the input interlaced scan data is met by the selector 140 which selects a signal Is output based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32) except for providing the newly added limitations the control command being generated based on video information associated with the input interlaced scan data, the video information indicating at least whether the interlaced scan data is frame based or field based interlaced scan data.

Itani teaches an image signal reproduction apparatus having the control command being generated based on video information associated with the input interlaced scan data, the video information indicating at least whether the interlaced scan data is frame based or field based interlaced scan data (see Fig. 1, elements 8-9 and 14-16, page 11, paragraph #0138).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the image signal reproduction apparatus as taught by Itani into Kim's system in order to output a progressive scanned image with a resolution close to the original film and with less degradation of resolution compared with the interlaced scanned image even in visual appreciation, after subjecting the film material image signal to progressive scanning conversion.

In considering claim 2, the claimed wherein the control command indicates to perform one of at least a spatial interpolation IPC technique and a spatial/temporal interpolation IPC technique is met by the selector 140 which selects a signal Is output

based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32).

In considering claim 3, Kim discloses all the claimed subject matter, note 1) the claimed wherein the spatial interpolation IPC technique performs spatial interpolation on a current field of the input interlaced scan data to produce a field of complementary scan data that together with the current field represents a frame of progressive scan data is met by the spatial interpolator 110 which is simple line doubling (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21),.and 2) the claimed the spatial/temporal interpolation IPC technique performs directionally adaptive spatial interpolation selectively combined with temporal interpolation using the current field, at least one previous field and at least one subsequent field of the input interlaced scan data to produce a field of complementary scan data that together with the current field represents a frame of progressive scan data is met by the temporal interpolator 120 which is edge direction (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 4, the claimed wherein the spatial/temporal interpolation IPC technique is adaptive is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 6, the claimed wherein the control command indicates to perform one of at least a spatial interpolation IPC technique, an alternative field output IPC technique in which two consecutive fields of the input interlaced scan data are alternately output on a scan line by scan line basis to produce a frame of progressive

scan data, and a spatial/temporal interpolation IPC technique is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

Claim 8 is rejected for the same reason as discussed in claim 1.

Claim 9 is rejected for the same reason as discussed in claim 2.

Claims 10-11 are rejected for the same reason as discussed in claims 3-4, respectively.

Claim 12 is rejected for the same reason as discussed in claim 6.

In considering claim 13, the claimed wherein the conversion structure comprises: an interpolator configured to interpolate lines of a frame of progressive scan data missing from a current field of the input interlaced scan data by spatially interpolating the missing lines using the current field is met by the spatial interpolator 110 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 14, the claimed wherein the conversion structure is configured to supply the selector with the input interlaced scan data of a current field and one of a preceding and following field of the input interlaced scan data is met by the selector 140 which selects a signal Is output based on basis of the compared results as an interpolated signal Vout (Fig. 1, col. 3, line 48 to col. 4, line 21 and col. 6, line 50 to col. 7, line 32).

In considering claim 15, the claimed wherein the conversion structure comprises: a spatial/temporal interpolator configured to perform a spatial/temporal interpolation IPC conversion technique on the input interlaced scan data to produce a portion of the

progressive scan data is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 16, the claimed wherein the spatial/temporal interpolator is configured to perform adaptive spatial/temporal interpolation is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 17, the claimed wherein the spatial/temporal interpolator is configured to perform directionally adaptive spatial interpolation is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 18, the claimed wherein the spatial/temporal interpolator is configured to directionally adapt the spatial interpolation based on a measure of a difference between pixels neighboring a pixel being interpolated is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 19, the claimed wherein the spatial/temporal interpolator is configured to adapt the spatial/temporal interpolation based on a complexity of an image is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

In considering claim 20, the claimed wherein the spatial/temporal interpolator is configured to adapt the spatial/temporal interpolation to reduce an influence of the

temporal interpolation as a change in an image over time increases is met by the spatial interpolator 110 and the temporal interpolator 120 (Fig. 1, col. 1, line 27 to col. 2, line 29 and col. 3, line 48 to col. 4, line 21).

Claim 21 is rejected for the same reason as discussed in claim 3 and further the claimed the selector is configured to receive output of the interpolator, and output of the spatial/temporal interpolator.

Claim 23 is rejected for the same reason as discussed in claim 7.

Allowable Subject Matter

6. Claims 32-34 are allowed.

7. Claims 5, 7 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (571) 272-7358. The examiner can normally be reached on 8:00 AM - 5:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Ometz can be reached on (571) 272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

December 10, 2007

Trang U. Tran
Primary Examiner
Art Unit 2622